December 19, 2023

DISTRIBUTION LIST

Waste Management Plan v.3.0 for Renewal of Land Use Permit W2016J0008 – Tundra Ecosystem Research Station, Daring Lake

Please accept this letter and attachment as the Waste Management Plan submission for section 11 of the Land Use Permit Application Package, associated with the renewal of the above referenced Land Use Permit for the Tundra Ecosystem Research Station (TERS) located at Daring Lake.

The permit W2016J0008 is currently expired as of November 3, 2023. A renewal would render it valid until November 2028. The activities for waste management at the research station have remained the same as were originally permitted. Currently a Storage Authorization is in place until a new Land Use Permit can be granted to support continuing land use activities at TERS.

Please direct any comments or concerns with respect to the permit renewal to Colin Modeste-Burgin, TERS Camp Manager, at Colin_Modeste-Burgin@gov.nt.ca

Sincerely,

Heather Sayine-Crawford
Director
Wildlife Management Division

Attachments:

- ✓ Land Use Permit Application Form
- ✓ Spill Contingency Plan – v.4.0
- ✓ **Waste Management Plan – v.3.0**
- ✓ Project Details Plan
- ✓ Engagement Plan v.2.0
- ✓ Engagement Summary & Record

Waste Management Plan

Tundra Ecosystem Research Station

Daring Lake, NWT

Prepared for: 2023 Land Use Permit Application

Version 3.0

GNWT-ECC-Wildlife Division

TERS- Daring Lake, NWT

W2016J0008

Nov 2023

Project Summary

This waste management plan has been developed for the Tundra Ecosystem Research Station (TERS), located at Daring Lake, coordinates: 64°52'N, and 111° 35'W. TERS is operated by the Department of Environment and Climate Change (ECC), Government of the Northwest Territories (GNWT).

The current version of the waste management plan, associated to land use permit W2016J0008 will remain effective. This waste management plan, v.3.0 will then replace that plan and become effective once a new land use permit is approved.

Operations at TERS for waste management remain the same and have not changed. Additional copies of the current waste management plan are always available on site, copies are also kept in the Wildlife Management Division, ECC, in Yellowknife.

This waste management plan has been developed to provide a plan of action in response to any waste generated at TERS. Overall, this plan describes the protocols, responsibilities of the on site contact for TERS, and details of the station, kits, and materials in place during the operation of the GNWT Tundra Ecosystem Research Station at Daring Lake, Northwest Territories.

Revision History

Version #	Date	Section	Revision
1	Jul 2009	All	▪ Submitted to WLWB July 24, 2009
2.0	Sep 2016	General	▪ Cover page
		1.0	▪ Updated Intro section
		Tb. 1	▪ Updated Hazardous Waste Disposal section
3.0	Nov 2023	General	▪ Added cover letter. ▪ Updated cover page and document format ▪ Added summary section. ▪ Added revision history and conformity tables. ▪ Added definitions and acronyms section
		1.0 – 1.8	▪ Added Director contact information for whole project. ▪ Added project information of TERS. ▪ Added effective date section, originally in introduction. ▪ Added revisions section. ▪ Added distribution list section. ▪ Added TERS environmental policy. ▪ Added purpose and scope. ▪ Added project and site description and site map
		1.9.2	▪ Updated species at risk list
		2.0 – 2.2	▪ Added identification of waste types o hazardous or potentially hazardous and non-mineral waste types
		3.0 – 3.2.7	▪ Updated section for management of each waste type
		4.0 – 4.2	▪ Added waste management infrastructure. ▪ Added offsite disposal facilities
		Appendix 1&2	▪ Added Appendix 1 – Yellowknife SWF Letter ▪ Added Appendix 2 – KBL Environmental Ltd. Letter

Conformity Table – Permit/Licence Conditions

Permit Condition	Permit Conditions	Location of Information	Conditions met
26 (1)(a)	Location and Area ▪ Existing Camp Location of Activities	Sections: 1.0, 1.7, 1.8, 1.8.1	✓
26 (1)(b)	Time ▪ Shall contact Inspector. ▪ Identify agent ▪ Reports before removal	Sections: 1.0-1.4	✓
26 (1)(c)	Type and Size of Equipment ▪ Only approved equipment	Sections: 4.1-4.2	✓
26 (1)(e)	Type, Location, Capacity, and Operation of all facilities ▪ Clean work area sumps from water	Sections: 1.8.1, 3.2, 3.2.7	✓
26 (1)(g)	Use, Storage, Handling, and Ultimate Disposal of Any Chemical or Toxic Material ▪ Report Spills ▪ Waste Petroleum Disposal	Sections: 2.0, 2.1, 3.0, 3.1, 3.1.3	✓
26 (1)(h)	Wildlife and Fish Habitat ▪ Habitat Damage	Sections: 1.5, 1.6, 1.7, 1.8, 3.0-3.2.7	✓
26 (1)(i)	Storage, Handling, and Disposal of Refuse or Sewage ▪ Waste Management ▪ Remove Garbage ▪ Sewage Disposal	Sections: All, 3.0-4.2	✓
26 (1)(m)	Fuel Storage ▪ Seal Outlet ▪ Fuel Containment ▪ Mark Containers ▪ Spill Contingency Plan ▪ Spill Response ▪ Drip Trays ▪ Fuel Near Water ▪ Clean Up Spills	Sections: 3.0 – 4.2	✓
26(1)(p)	Display of Permits and Permit Numbers - Display Permit - Resubmit Plan - Engagement Plan - Summary of changes	Sections: 1.0-1.8	✓

Conformity Table – WLWB and Public Review

Date	Organization	Topic
Oct 17, 2016	Review Board- Comment Summary	Hazardous Waste Disposal
Source	W2016J0008 - GNWT-ENR - TERS - Review Summary and Attachments - Oct 28_16.pdf (mvlwb.ca)	
Recommendation		
Recommendation: Please comment on the apparent inconsistencies. ▪ Page 11 of the Spill Contingency Plan (section 4.2.1) it is noted that contaminated absorbent mats would be disposed of through incineration. ▪ Page 12 (section 4.2.5) it also notes "any contaminated soil and/or vegetation will be placed on impermeable material and burned. All remaining soil/vegetation will be placed in bags or re-sealable metal drums (at least 3 onsite at any one time) and flown to Yellowknife for appropriate disposal. All fuel-soaked absorbent material will be incinerated." ▪ The Waste Management Plan notes that contaminated materials (i.e., absorbent pads) are shipped to Yellowknife for disposal.		
Proponent Response		
Oct 17, 2016: Thank you for noting these inconsistencies; they were not intentional. I would like to clarify that all fuel contaminated waste will be placed in bags or resealable metal drums and shipped off-site for disposal at an appropriate facility. I will revise the Spill Contingency Plan to reflect this statement and ensure it is consistent throughout.		

Oct 24, 2023	Wek'èezhìı Land and Water Board	General
Source	GNWT-ECC - TERS - LUP Application - Deemed Incomplete - Oct 24_23.pdf (mvlwb.ca)	
Recommendation		
• Add cover letter, cover page, revision history table, and conformity table		
Proponent Response		
Added/revised sections of plan		

07-Dec-2023	GNWT-ECC, Wildlife Biologist	General
Source	Email Correspondence: Pre-submission engagement	
Recommendation		
• Update species at risk list		
Proponent Response		
Updated species at risk list		

Acronyms

Term	Definition
ECC	Department of Environment and Climate Change
GNWT	Government of the Northwest Territories
LUP	Land Use Permit
M^3	Cubic Meter
SCP	Spill Contingency Plan
TDG	Transportation of Dangerous Goods
TERS	Tundra Ecosystem Research Station
TSCC	Tundra Science and Culture Camp
WHMIS	Workplace Hazardous Materials Information System
WLWB	Wek'èezhìı Land and Water Board
WMA	Wek'èezhìı Management Area
WMP	Waste Management Plan

Definitions

Term	Definition
Combustible Waste	Waste that can be incinerated. Paper materials, non-treated wood, cardboard
Compostable Waste	Organic wastes
Construction Waste	Waste from construction: Lumber, Nails, Screws, Insulation, Scrap metals etc.
Domestic Waste	Also known as household waste, which can include garbage or rubbish and normally originates in a private home. Domestic waste may contain a significant amount of toxic or hazardous waste
Grey Water	Kitchen and wash tent water, used from dishes, showers, etc.
Hazardous Waste	A waste which, because of its quantity, concentration, or characteristics, may be harmful to human health or the environment when improperly treated, stored, transported, or disposed.
Non-Combustible Waste	Waste that cannot be incinerated. Plastics, packaging, food, compostable products, recyclable or reusable waste.
Putrescible Waste	Solid waste that contains organic matter, including household waste which contains organics.
Recyclable Waste	Waste that can be recycled, box board, cardboard, tin cans, glass, beverage containers, plastics, aluminum cans
Sewage	Black wastewater, incinerating toilet ash, honey bucket sewage and pit latrine

Table of Contents

List of Tables and Figures

1.0 Introduction

This Waste Management Plan has been developed for the Tundra Ecosystem Research Station (TERS), located at Daring Lake, Coordinates: 64° 52'N, and 111° 35'W. TERS is operated by the Department of Environment and Climate Change (ECC), Government of the Northwest Territories (GNWT).

This plan has been developed to provide information in response to any waste generated at the Tundra Ecosystem Research Station (TERS). Overall, this plan identifies the type of waste produced and the protocols in place for waste handling and disposal.

Additional copies of the waste management plan (WMP) are available onsite. Copies are also kept at the Wildlife Management Division, ECC, in Yellowknife.

Contact information contained in this document is **updated annually**.

1.1 Project and Contact Information

Contact Information

Name:	**Heather Sayine-Crawford**		
Position:	Director, Wildlife Management Division		
Company Name:	Environment and Climate Change, Government of the Northwest Territories		
Mailing Address:	PO Box 1320		
Community:	Yellowknife	**Telephone:**	867-767-9237 ext. 53230
Prov/Terr:	NWT	**Email:**	Heather_Sayine-Crawford@gov.nt.ca
Postal Code:	X1A 2L9	**Other:**	

Project Information

Project Name:	**Tundra Ecosystem Research Station (TERS)**		
Department	GNWT – Environment and Climate Change – Wildlife Management Division		
Location:	Daring Lake, NWT	Region:	North Slave
Coordinates:	64°52'N, and 111° 35'W.	Operation Date:	May – September
TERS On-site Manager:	Colin Modeste-Burgin		
Email:	Colin_modeste-Burgin@gov.nt.ca	Phone:	867-446-5995
On-site Sat Phone:	011-8816-315-64342	Land Use Permit:	W2016J0008 Expires: 03-Nov-2023

1.2 Effective Date of Waste Management Plan v.3.0

The current version of the waste management plan associated with Land Use Permit W2016J0008 will remain active. This version of the plan – Waste Management Plan v.3.0 will be effective once a new land use permit is granted and replace the previous version.

Prior to seasonal commencement, an email notification at least 48 hours before land use operations will be sent to the Land's inspector and associated parties within the Distribution List below. This will include a start date, project contacts (onsite and offsite managers) and contact information. A similar email will be sent ten days prior to re-iterate a seasonal camp shutdown of land-use operations.

1.3 Revisions to Waste Management Plan v.3.0

The most recent revision occurred in November 2023 (please see revision history and the conformity tables on pg ii). Revisions are made by the GNWT Wildlife Management Division. Updates will occur in response to any comments made from the Wek'èezhìı Land and Water Board and involved parties of the Tundra Ecosystem Research Station, see conformity table on pg. iii, and pg. iv of this Waste Management plan for any related updates. This plan is reviewed annually, and approved Permits are displayed onsite.

1.4 Distribution List

This Waste Management Plan and the most recent revisions have been distributed to the following:

Representative(s)	Association
Ryan Fequet **Anneli Jokela** **Roberta Judas**	Wek'èezhìı Land and Water Board (WLWB)
Violet Camsell-Blondin	Tlicho Government
Stephanie Poole	NWT Treaty 8 Tribal Corporation – Akaitcho Interim Measures Agreement Implementation Office
Wynter Kuliktana **Tannis Bolt**	Kitikmeot Inuit Association
Noah Johnson	North Slave Metis Alliance
Johanne Black **Ryan Miller**	Yellowknives Dene First Nation
Minnie Whimp	Deninu Kue First Nation
Tas-Tsi Catholique	Lutsel K'e Dene First Nation
Jody Pellissey **Laura Meinert**	Wek'èezhìı Renewable Resource Board
Naomi Smethurst **Glen Mackay**	GNWT- Prince of Wales Northern Heritage Centre
Scott Stewart	GNWT – ECC, Regional Superintendent of the North Slave Region
James Hodson	GNWT – ECC, Wildlife Biologist
Clint Ambrose **Karine Gignac**	GNWT – ECC, North Slave Region

1.5 Purpose and Scope of Waste Management Plan

TERS management is committed to the development and implementation of a waste management / recycling program. The purpose is to create an environment as waste-free as possible within the operation. TERS will focus on reduction, reuse, and recycling of waste.

Waste disposal from TERS will adhere to all relevant regulations, acts, and permit conditions. This plan will be implemented and remain active for the duration of the Land Use Permit Renewal.

1.6 TERS Environmental Policy

GNWT-ECC is committed to providing a quality research facility and safe working environment for all users of TERS. All activities are to be conducted in a manner that is safe to people and the environment. Each individual user of TERS is to share in the responsibility of ensuring the safety of themselves and others while respecting the environment and maintaining the high standards established for camp operations. All persons are expected to take the necessary precautions to protect themselves and others from undue risk.

1.7 Project Description – TERS

TERS functions as a base for both short (1 year) to long (15+ years) ecosystem research and monitoring. The station was originally set up to serve as a control site for studies examining the effects of the Ekati diamond mine on the environment. Since its inception, it has grown to provide support for university along with intra- and inter-governmental research in addition to continuing monitoring programs associated with the Ekati and Diavik diamond mines.

TERS also provides educational programs, including the annual Tundra Science and Culture Camp (TSCC). The TSCC is a ten-day cross-cultural science camp for 14- to 17-year-old students from communities across the NWT. The TSCC has a joint focus of scientific instruction and traditional knowledge studies with participation from the surrounding Tłı̨chǫ communities. Research at TERS involves measuring ecological and climate related changes on a pristine subarctic ecosystem. As such, TERS endeavors to have minimal environmental impact.

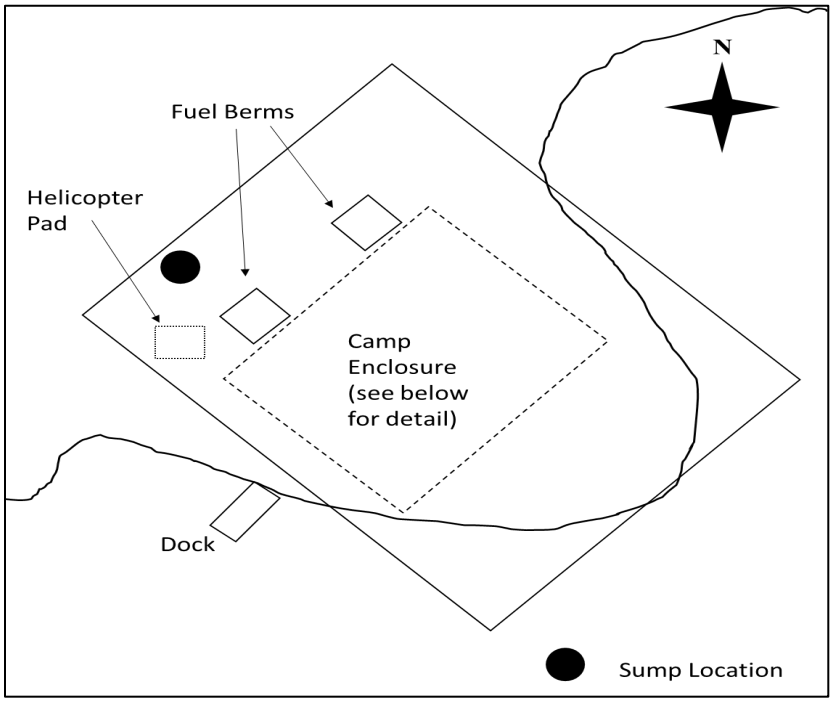
1.8 Site Description – TERS

The TERS camp is located approximately 300 km north of Yellowknife. It encompasses an area of approximately 0.5 hectares on the shores of Daring Lake, NT (64° 52’N, 111°35’W). The camp is located on a flat area on the south side of an esker. There are 10 Weatherhaven tents (2 bunk tents, 1 kitchen tent, 2 labs, 1 wash house, 3 storages, 1 office). Other structures include a fuel/tool storage shed, 2 latrines, an incinerating toilet building, a dock, and boardwalks throughout. The entire living area (including all structures except the dock) is enclosed by a solar-powered electric bear fence.

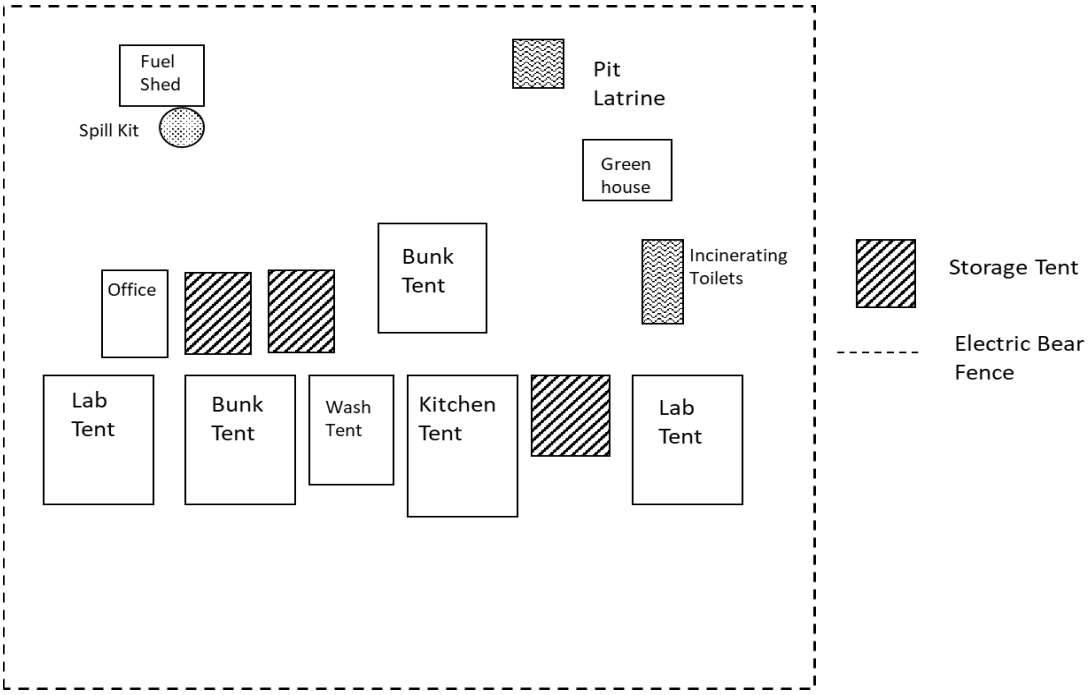
1.8.1 Site Map – TERS

Figure 1 - Drawing depicting a) the placement of the land use permit area, camp and fuel cache, as well as b) detail of the camp layout. Not drawn to scale.

a) Land Use Permit Area, Camp and Fuel Cache



b) Camp Layout Detail (Not drawn to scale)



1.9 Potential Ecological Impacts

1.9.1 Barren ground Caribou

TERS is located within the range (migration route) of the Bathurst caribou herd. Caribou are frequently sighted by camp residents during the spring (May) and late summer (August onwards) months. There are no activities at the research station that may potentially disrupt caribou activities. Air traffic to and from the camp consists of approximately 0-2 flights per week, pilots maintain safe flying altitudes (500m) when and if large groups of caribou (>200 animals) are sighted in the area. There is a strict no-hunting policy followed by all researchers using the camp.

1.9.2 Species at Risk, COSEWIC Assessed Species

Monitoring programs ongoing at TERS collect data on all the species listed below. In addition, every precaution is taken to limit any impact the presence of TERS has on these species, and their habitat. There are several species that may occur in the Daring Lake area that have been assessed, these include:

Species	NWT SARC	COSEWIC	SARA	NWT GS Rank
Barren-ground Caribou	Threatened	Threatened	Under consideration	At Risk
Grizzly Bear	Special Concern	Special Concern	Special Concern	Sensitive
Wolverine	Not at risk	Special Concern	Special Concern	Sensitive
Eskimo Curlew	Not applicable	Endangered	Endangered	At Risk
Harris's Sparrow	Not applicable	Special Concern	Special Concern	Sensitive
Lesser Yellowlegs	Not applicable	Threatened	Under consideration	Sensitive
Peregrine Falcon (Anatum-tundrius complex)	Not at Risk	Not at risk	No status	Sensitive
Red-necked Phalarope	Not Applicable	Special Concern	Special Concern	Sensitive
Rusty Blackbird	Not assessed	Special Concern	Special Concern	Sensitive
Short-eared Owl	Not assessed	Threatened	Special Concern	At Risk

1.9.3 Archaeological Sites

There are a number of archaeological sites located in the vicinity of TERS. These have been identified and inventoried by staff from the Prince of Wales Northern Heritage Centre, in Yellowknife. The location of the camp itself does not infringe on any archaeological sites.

2.0 Identification of Waste Types

TERS is open from May until September. During the timeframe of operation, the number of residents varies from 2 to 35. In general, the camp is populated by a small (~4-10) group of researchers, plus an onsite camp manager. The population is at its maximum of 35 for ten days at the end of July to early August, at which time TERS hosts the Tundra Science and Culture Camp. TERS endeavors to be as clean as possible with respect to waste storage and disposal. Back hauls are used whenever possible to remove waste from the site. As an added precaution, the camp is enclosed in an electric bear fence to further deter any curious animals from the site.

In general, TERS does not produce a large quantity of waste. However, the waste generally produced or potentially produced are listed below:

2.1 Hazardous or Potentially Hazardous Waste

Operations at TERS involves the use of solar power, mobile equipment, various equipment/supplies, and fuel caching. The list below describes the types of hazardous or potentially hazardous waste that the facility will oversee in an operating season. Further descriptions of fuel normally cached at TERS is listed within the Spill Contingency Plan.

Table 1: Identification List - Hazardous or Potentially Hazardous Waste

Waste Type	Source	Estimated Quantity Produced	Potential Environmental Effects
Batteries ▪ Lead acid ▪ AA, AAA D, 9 Volt ▪ 12/24 Volts	-Solar Panels -Mobile Equipment -Electronic Devices -General equipment	Minimal - a few produced within a season	Contamination of ground or water and litter
Chemical Wastes ▪ Solid ▪ Liquid	-Paint/ Stain -Propane Tanks -Cleaning Supplies -Bear Spray	Minimal - see Spill Contingency Plan.	Contamination of ground or water and litter
Contaminated Soils **Spills – See (SCP)**	-Spills (Fuel Cache) -Spills (Heating Tanks)	Minimal - Regular inspection occurs onsite. See Spill Contingency Plan.	Improper maintenance/ management can cause harm to wildlife and aquatic life. Potential to bioaccumulate and slow to biodegrade.
Other ▪ Fuel/ Oil ▪ Grease/ Lubricants ▪ Solvent/ Supplies	-Mobile Equipment -General Equipment -Fuel Cache, -Heating Tanks -Equipment Supplies	Minimal - Regular inspection occurs onsite. See Spill Contingency Plan.	Contamination of ground or water and litter. Can cause harm to wildlife and aquatic life. Potential to bioaccumulate and slow to biodegrade.
Ash	-Incinerator Toilet -Modified Burn Barrel	Minimal - average crew of 4-10 users	Contamination of ground or water and litter

2.2 Non-mineral Waste

Non-mineral waste produced at TERS will be separated and managed accordingly: Combustible, non-combustible, recyclable, compostable, construction, sewage, and grey water. The table below identifies the waste produced at TERS within an operating season.

Table 2: Identification List – Non-mineral Waste

Waste Type	Source	Estimated Quantity Produced	Potential Environmental Effects
Domestic Waste Recyclables Putrescible Waste	Food preparation Plastics Cans/Tin Cans Glass Mixed Paper Cardboard Organics	Minimal -Average crew from 4-10 users - During TSCC (10 days), more will be produced	Poor management of waste could lead to litter and could attract wildlife to TERS.
Bulky Metals	Mobile Equipment General Equipment Scrap metals	Minimal	Potential for litter, and spills.
Construction Materials	Lumber insulation, etc.	Minimal	Potential for litter.
Sewage	Pit Latrine Honey Bucket	Estimated at 0.025 - 0.05 m^3 /day	Attract wildlife. Damage to environment Water contamination
Grey Water	Kitchen Tent Wash Tent	Estimated at 0.05 – 0.25 m^3 /day	Attract wildlife. Damage to environment Water Contamination

3.0 Management of Each Waste Type

Effective waste management is important to avoid health, safety, and wildlife issues at TERS. Maintaining a clean camp will minimize attraction of wildlife to the facility and the possibility of a human/wildlife encounter and damage to the environment. Regular maintenance of the various types of equipment will ensure that spills or accidents are minimized for worker safety and the health of the environment. Camp waste at TERS is managed through a variety of practices depending on the type of waste produced. Consideration is given to the types of materials and supplies brought to camp given that most waste must be transported back to Yellowknife in one form or another. The principle of "reduce, recycle and reuse" is always implemented at TERS. Waste will be managed based on the following categories:

- Hazardous or potentially Hazardous Waste
- Combustible Waste
- Non-Combustible Waste
- Recyclable Waste
- Compostable Waste
- Construction Material Waste
- Sewage
- Grey Water

3.1 Management of Hazardous or Potentially Hazardous Waste

Table 3 listed below describes a general overview of how hazardous or potentially hazardous waste is handled at TERS, from storage on-site to eventual disposal off-site. A more thorough description for each hazardous or potentially hazardous waste type will be outlined from 3.1.1 to 3.1.4.

Table 3: Management Table: Hazardous or Potentially Hazardous Waste

Waste Type	Storage	Disposal
Batteries • Lead Acid • AA, AAA, D, 9-Volt • 12/24 Volts Chemical Wastes • Solids • Liquids Contaminated Soils **Spills – See Spill Contingency Plan** Equipment Materials • Fuel/ Oil • Grease/ Lubricants • Solvent/ Supplies Ash ▪ Incinerator Toilet ▪ Modified Burn Barrel	All hazardous and potentially hazardous wastes will be collected, separated, and stored in the following ways, as appropriate: - Packed in sealed containers with impermeable lining. - Clearly labelled with hazard identification, type, and appropriate hazard label. - Stored in secure location within camp compound for time being. - Empty fuel drums/propane tanks etc. are stored on site and shipped out on next available flight. - Absorbent pads etc. used for minor spill cleanup are temporarily stored in a bucket in the fuel shed. *See also Spill Contingency Plan.	All hazardous and potentially hazardous wastes will be transported as soon as possible to Yellowknife and recycled or disposed of at an approved facility. Approved Facilities include: - KBL Environmental Ltd. (See Appendix 2)

3.1.1 Waste Batteries

TERS operations requires the use of different types of batteries for the various equipment on site. Improper handling of batteries can result in spillage of corrosive materials. Waste battery management methods include the following:

Storage: Storing of waste batteries will only occur for the interim time between flights throughout the operating season at TERS. They will be packed in sealable, sound, and undamaged containers that cannot corrode if a leak were to occur, and will be clearly labeled and temporarily stored in one of the Weather haven storage tents until the next available flight out of TERS. They will also be separated by type and size according to Table 4 listed below.

Disposal: If batteries are spent and cannot maintain a charge, they will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping and appropriately packaged.

Table 4: Types of Batteries

Battery Type	Uses at TERS
Alkaline	▪ GPS units ▪ Headlamps ▪ Other small personal electronics
Nickel/Cadmium (NiCd)	▪ Laptops ▪ Radios ▪ Cordless power tools
Lithium Ion or Nickel Hydride	▪ Cell phones ▪ Cameras ▪ Newer laptops
Lead Acid Batteries	▪ Mobile Equipment ▪ Deep Cycle Batteries ▪ Solar
Mercury or Silver Oxide	▪ Watches

Minimizing the risks of pollution or spills, TERS will manage waste batteries according to the following steps below:

Reduce: Maintaining and protecting batteries from damage, testing batteries to ensure they are spent before disposal, and switching to rechargeable batteries where possible.

Recycling: Servicing batteries and sending damaged or spent batteries to recyclers.

Onsite monitoring: Actively checking if batteries on site are in a good working condition, with no leaks or damage, and cleaning of the battery terminals.

3.1.2 Chemical Wastes

Improper handling of chemical products can result in exposure to the environment and its waterways. TERS chemical waste management methods include the following:

Storage: Storing chemical waste will only occur for the interim time between flights throughout the operating season at TERS. They will be packed in sealable, sound, and undamaged containers or in the original containers in which they were received, and they will be separated by compatibility. They will also be clearly labeled according to WHMIS conditions and temporarily stored in one of the Weatherhaven storage tents until the next available flight out of TERS. They will also be separated by type according to Table 5 listed below.

Disposal: Chemical wastes will not be incinerated, instead they will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping, separated, and appropriately packaged.

Table 5: Chemical Waste

Waste Type (Chemicals)	Uses at TERS
Treated Wood	▪ Construction/ maintenance
Paint	▪ Construction/ maintenence
Oils, Solvents, Fuel, Grease, Lubricants, etc.	▪ Mobile equipment ▪ General Equipment
Bear Spray, Bangers	▪ Wildlife Deterrent
Propane	▪ Cooking ▪ Incinerator toilet
Cleaning Supplies	▪ Cleaning of camp

3.1.3 Contaminated Soils & Equipment Materials

Please refer to the Spill Contingency Plan prepared for this section.

3.1.4 Ash

TERS operations will produce some ash, either from the incinerating toilets or the modified burn barrel. Improper handling of ash can result in exposure to the environment and its waterways. Ash management methods include the following:

Storage: Storing ash residue will only occur for the interim time between flights throughout the operating season at TERS. They will be packed in sealable, sound, undamaged containers with an impermeable lining, they will be clearly labeled according to generated residue (i.e., incinerator toilet, modified burn barrel) and temporarily stored in one of the Weatherhaven storage tents until the next available flight out of TERS.

Disposal: Ash will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping and appropriately packaged.

3.2 Management of Non-Mineral Waste

Table 4 listed below describes a general overview of how non-mineral waste is handled at TERS, from storage on site to eventual disposal. A more thorough description for each non-mineral waste type management outcome will be outlined from 3.3.1 to 3.3.7.

Table 6: Management Table: Non-Mineral Waste

Waste Type	Storage	Disposal
Domestic Waste Recyclables Putrescible Waste	All domestic, recyclable, and putrescible waste products are stored and handled in the following ways: - Packaging from meat products are placed in plastic containers, and frozen until disposal. - Burnable food waste is separated from non-burnable (i.e., plastics, etc.) and recycling, and is kept in an airtight garbage container in the kitchen tent until the container is full. - Recyclable goods and plastics are cleaned and stored in the kitchen tent or in a separate tent. - During TSCC, compost is separated from other kitchen wastes and stored in plastic (airtight) buckets in a storage tent.	All domestic, recyclable, and putrescible waste products are disposed of in the following ways: - Waste is shipped to Yellowknife for disposal in the landfill. Approved letter in appendix 1 - Plastics are never incinerated, and always taken to YK for disposal. Recyclable goods are always shipped to YK and taken to recycling depots. - If hauling of waste is not possible, burnable waste is incinerated in a Smart Ash incinerator. Ashes are hauled to YK for disposal. - If compost is being separated from other kitchen waste, it is shipped to YK for disposal at the YK community garden compost.
Bulky Metals Construction Materials	All Bulky metals and construction materials will be stored and handled in the following ways: - Separated and stored onsite within the compound. - Broken down and stored in totes.	All bulky metals and construction materials will be disposed of in the following ways: - Inspected before disposal. - Shipped back to YK to be recycled or disposed of appropriately.
Sewage	TERS is equipped with a pit latrine, incinerating toilet and honey bucket in colder months when the incinerating toilet is not available for use. Sewage is handled in the following ways: - Pit Latrine: 100 m from high water mark - Honey Bags: Stored in sealable drums	All sewage at TERS will be disposed of in the following ways: - Ash from incinerating toilet is disposed of in the YK landfill. - Honey bags are shipped to YK for appropriate disposal in the sewage lagoon.
Grey water	Grey water is pumped to a sump located 100m from the nearest highwater mark.	Grey water dissipates through the soil over time.

3.2.1 Combustible Waste

TERS operations will produce some combustible waste. Types of combustible waste include un-inked paper materials, non-treated wood, and cardboard. Improper handling of combustible waste can result in exposure to the environment, increased wildlife attractants, and littering. Combustible waste management methods include the following:

Storage: If incineration does not occur, combustible waste storage will occur for the interim time between flights throughout the operating season at TERS. Combustible waste will be packed in sealable, sound, and undamaged containers and temporarily stored in one of the Weather haven storage tents until the next available flight out of TERS.

Disposal: Combustible wastes will be incinerated in the modified burn barrel if time between flights is too long, otherwise they will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping, separated, and appropriately packaged.

3.2.2 Non-Combustible Waste

TERS operations will produce some non-combustible waste. Types of non-combustible waste include food, packaging, compostable products, recyclable or reusable materials. Improper handling of non-combustible waste can result in exposure to the environment, increased wildlife attractants, and littering. Combustible waste management methods include the following:

Storage: Non-combustible waste storage will occur for the interim time between flights throughout the operating season at TERS. They will be packed in sealable, sound, and undamaged containers and will be temporarily stored in one of the Weatherhaven storage tents until the next available flight out of TERS.

Disposal: Non-combustible waste will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping, separated, and appropriately packaged.

3.2.3 Recyclable Waste

Materials recycled at TERS include paper products such as boxboard and cardboard, tin cans, glass containers, recyclable plastics, and aluminum cans. All items are in a clean state and crushed (where appropriate) prior to disposal.

Storage: Recyclable material storage will occur for the interim time between flights throughout the operating season at TERS. These items are then segregated, boxed, and labeled and will be temporarily stored in one of the Weatherhaven storage tents until the next available flight out of TERS.

Disposal: Non-combustible waste will be transported out of TERS on the next flight and sent to the appropriate disposal facility. They will be clearly labeled for shipping, separated, and appropriately packaged. They will then be shipped to Yellowknife where they are taken to one of the recycling facilities. Cardboard is bundled with string or tape prior to shipment. All expended batteries are also to be recycled. Boxes or bags of recyclables are clearly marked for recycling.

3.2.4 Compostable Waste

TERS operations will produce some compostable waste. Compostable waste includes organic materials such as food products. Improper handling of compostable waste can result in exposure to the environment, increased wildlife attractants, and littering. Compostable waste management methods include the following:

Storage: Compostable waste storage will occur for the interim time between flights throughout the operating season at TERS. They will be packed in sealable, sound, and undamaged containers and will be temporarily stored in one of the wood-constructed storage buildings until the next available flight out of TERS.

Disposal: Compostable waste will be transported out of TERS on the next flight and sent to the Yellowknife Community Garden Compost Bin. It will be clearly labeled for shipping, separated, and appropriately packaged for transport.

3.2.5 Construction Material Waste

TERS operations will produce some construction material waste. Types of construction material waste include treated/un-treated wood, nails/screws, scrap metal, insulation, etc. Improper handling of construction material waste can result in exposure to the environment and littering. Construction material waste management methods include the following:

Storage: Construction material waste storage will occur for the interim time between flights throughout the operating season at TERS. It will be packed in sound and undamaged containers, separated, and be temporarily stored on site until the next available flight out of TERS.

Disposal: Construction material waste will be transported out of TERS on the next flight and sent to the appropriate disposal facility. It will be clearly labeled for shipping, separated, and appropriately packaged.

3.2.6 Sewage

TERS operations will produce sewage, either as ash from the incinerating toilets or in the pit latrine. Improper handling of ash and sewage can result in exposure to the environment and its waterways. Please see ash management methods above in section 3.1.4. For the pit latrine, management methods include the following:

Storage: Pit latrines shall be contained in pits, dug to at least 2m, and positioned at least 100 m from any high-water mark. Wood constructed outhouses will accompany the pits to prevent open exposure of the pit.

Disposal: Once an outhouse pit is no longer needed, lime shall be applied to the pit to minimize odors, and it will be backfilled and reclaimed. Pits will be monitored frequently and once near capacity a new pit will be started.

3.2.7 Grey Water

TERS operations will produce grey water from the kitchen and wash tents. Improper handling of grey water can result in exposure to the environment and its waterways and increase wildlife attractants. Grey water management methods include the following:

Storage: Gravity drainage occurs from the kitchen and wash tent facilities to a 1000 L grey water tank that sits outside of the enclosed camp that is pumped to a sump located at the base of an esker behind camp.

Disposal: The sump is a closed system that is monitored frequently located at the base of the esker behind camp. The sump is a gravel filled enclosed system used to drain grey water seeping into the esker. It is a filtered system to prevent food scraps from entering the sump.

4.0 Waste Management Infrastructure

Various types of waste will be produced during the operating season at TERS. It is essential that proper waste management procedures are followed in a safe and sustainable manner. Due to the nature of TERS, being a remote fly-in facility, off-site disposal is mandatory. A description of the current onsite infrastructure is listed below in section 4.1, along with the methods of offsite disposal in section 4.2.

4.1 Current On-site Infrastructure:

Electric Fence: TERS uses a solar powered 12V electric fence to deter wildlife from entering the compound and provide protection for people in camp. The electric fence at Daring Lake consists of a 6 – strand high tensile fence, a solar panel and charge controller, and two 12V storage batteries. Two gates are located along the fence to provide access to the compound.

Secondary Containment Fuel Berm: The Containment Fuel berms on site are two Insta-Berm portable fuel berms (http://www.sei-ind.com/products/insta-berm), approximately 10’ X 20’ X 12” in size, that provide secondary containment in the event of leakage. The camp is situated on a small peninsula and the fuel cache is situated at the farthest possible point from the Daring Lake high water mark. Secondary containment is maintained throughout the operating season by ensuring any accumulated water / debris is removed, material is intact and side L-brackets are properly situated.

Spill Kit: A Fuel Spill Response Kit is located adjacent to the fuel shed by the back access gate to the fuel cache site. The contents of the kit are listed in Section 5.0 of the Spill Contingency Plan.

Recycling: Recycling bins are in the kitchen tent; non-hazardous recyclable materials are cleaned and placed in bins for temporary storage until they can be shipped out in clearly marked and separated boxes or bags.

Sealable Containers: There are three re-sealable metal drums on site at any one time.

Grey Water Tank: Greywater sources include the kitchen sink, shower, wash tub and wash tent sink. The grey water tank is located outside the electric fence. A common drain line connects all the source fixtures and drains into a 1000L fibreglass holding tank operating as a gravity-fed system. Greywater in

the holding tank is filtered and pumped (24V) through a 1" flexible PVC plastic pipe to a sump located at the base of the esker, behind the camp.

Grey Water Sump: The sump consists of a six-foot diameter hole dug three feet into the ground and lined with a fibreglass ring. A circular piece of plywood is screwed to the top of the fibreglass ring to prevent wildlife from accessing the sump. Essentially, the grey water system is a closed system with minimal attraction to wildlife. As a final step, sump water percolates through and is absorbed by the surrounding vegetation which is primarily moss/sedge tundra.

Pit Latrines/Incinerating Toilets: TERS currently has 2 options for human waste disposal on site. pit latrines and the Eco John Incinerating toilets.

Combustion Equipment: There is a modified burn barrel on site to burn untreated wood, paper materials and toilet paper if the time between flights is too long.

Fuel Shed: There is an 8x8 fuel shed on site near the back gate, this stores equipment and materials such as oils, paints, outboard motors, fuel pumps, etc.

4.2 Off-site Disposal Facilities

Back-haul flights to remove waste from the site are used whenever possible throughout the operating season at TERS. Listed below are the facilities TERS operates with offsite in Yellowknife.

Yellowknife Solid Waste Facility: Please see Appendix 1 for the approval letter from the Yellowknife Solid Waste Facility. It is currently valid until Dec 2025; the facility will only grant two-year maximum approval letters. GNWT-ECC-Wildlife Management Division will send an updated letter of approval in 2025 to WLWB to add to the associated land use permit in which TERS is applying for a renewal.

KBL Environmental Ltd.: Please see Appendix 2 for the approval letter from KBL Environmental Ltd. The approval is valid until Dec 2028 for the duration of a five-year land use permit.

Kavanaugh Waste Removal Services: This is a paid for disposal bin through Kavanaugh Waste Removal Services that provides another option for non-hazardous camp waste disposal. This business disposal bin is paid for by GNWT-ECC-Wildlife Management Division which operates TERS. The bin is located at the GNWT-ECC warehouse in Kam Lake.

Yellowknife Community Garden Compost: Compost is stored in sealed white pails and shipped to Yellowknife on back haul flights where it can be taken to one of Yellowknife's community gardens.

Yellowknife Public Recycling Bins: Materials recycled at Daring Lake include paper products such as boxboard and cardboard, tin cans, glass containers, recyclable plastics, and aluminum cans. All items are to be in a clean state and crushed (where appropriate) prior to disposal. These items are then segregated, boxed, and labeled, and shipped to Yellowknife where they are taken to one of the recycling facilities.

Appendix 1 – Letter of Waste Acceptance – City of Yellowknife: Solid Waste Facility

CITY OF YELLOWKNIFE

November 10, 2023

Tundra Ecosystem Research Station
Daring Lake, NWT

Attention: Mr. Colin Modeste-Burgin
Via email to: colin_modeste-burgin@gov.nt.ca

RE: Acceptance of Waste Materials from Tundra Ecosystem Research Station (TERS), Daring Lake

The City of Yellowknife approves the request to utilize the City's waste facilities for the TERS. Details regarding the waste types and receiving location are listed below.

Solid Waste Facility

- 5 to 10 bags of household solid waste per week

This waste will be subject to the Commercial Waste from Outside of City Limits tipping fee as outlined in the Fees and Charges By-Law 4436.

The City reserves the right to refuse waste from the project in question, at its sole discretion, at any time.

This agreement is valid until October 31, 2025.

Please feel free to contact the Solid Waste Facility if you have any further questions or concerns.

Sincerely,

Chris Vaughn
Manager, Sustainability and Solid Waste
Public Works and Engineering

WWW.YELLOWKNIFE.CA | YELLOWKNIFE CITY HALL | 4807 52ND STREET | BOX 580 | YELLOWKNIFE, NT | X1A 2N4 | (867) 920-5600

Appendix 2 – Letter of Waste Acceptance: Hazardous/Non-Hazardous – KBL

KBL

Contact
P 867.873.5263
F 867.669.5555
kblenv.com

Address
17 Cameron Rd
P.O. Box 1895
Yellowknife, NT X1A 2P4

September 25th, 2023

Government of the Northwest Territories

Re: Tundra Ecosystem Research Station (TERS) – Daring Lake NWT

To Whom It May Concern:

This letter is to confirm that KBL Environmental Ltd will accept both hazardous and non hazardous waste materials generated as a result of the GNWT and their Tundra Ecosystem Research Station (TERS) – Daring Lake NWT Project located at .64° 52'N, and 111° 35'W. Material will be accepted at our permitted Waste Transfer facility located in Yellowknife, NT at 17 Cameron Road (License Number NTR000123). More specifically, the waste streams that we can accepted from this specific project are (but not limited to):

- 1. Contaminated Soils - accompanied by analytical (Alberta Class 2 landfill Package)
- 2. Used oils
- 3. Lubricants, grease,
- 4. Coolants, filters or solvent
- 5. Contaminated Rags and Absorbents
- 6. Contaminated Plastics
- 7. Vegetation

This letter will remain valid through the duration of current date - December 31st 2028

Should you have any questions or require further information please call the office at 867-873-5263

Sincerely,

Caitlyn Thompson

Operations Manager
KBL Environmental Ltd.

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KBL